

Ezi-SERVO[®]

Closed Loop Stepping System





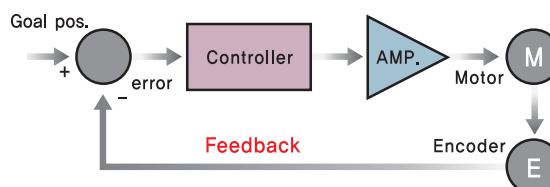
Ezi-SERVO[®]

Closed Loop Stepping System



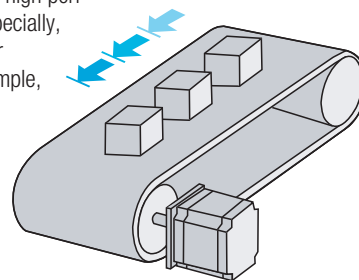
1 Closed Loop System

The Ezi-SERVO is an innovative closed loop stepping motor controller that utilizes a high-resolution encoder to constantly monitor the current motor shaft position. With the encoder feedback feature, the Ezi-SERVO keeps updating the current position information every 25 micro seconds. If necessary, the Ezi-SERVO takes a corrective action to compensate the loss of synchronization, for example, due to a sudden load change, eliminating missing step error, which is a typical drawback with stepping motors.



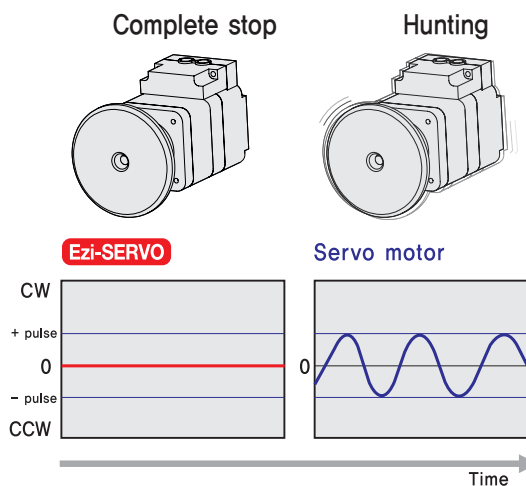
2 No Gain Tuning

In order to improve a control performance, tuning the gains of a servo system is the most crucial step. Depending on the source of a load change, this is a long, tedious, troublesome, and time-consuming job for an application field engineer. The Ezi-SERVO fully employs the unique characteristics of the closed loop stepping motor control, eliminating these cumbersome steps and giving the engineer a similar satisfaction with a high performance servo system. Especially, Ezi-SERVO is well suited for low stiffness loads (for example, a belt and pulley system) that are common problems experienced in a most servo system, while still maintaining the best performance in all situations.



3 No Hunting

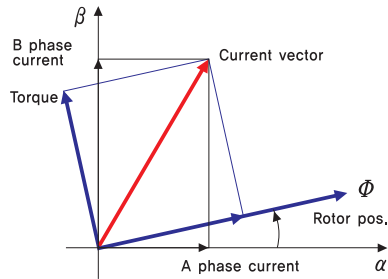
Contrary to a traditional servo motor drive, there is no problem of hunting in the Ezi-SERVO that utilizes the unique feature of stepping motors. After reaching a desired target position, Ezi-SERVO does not experience a fluctuation in motion. This feature is especially useful in an application such as vision systems in which vibration could be a problem.



4 Smooth and Accurate

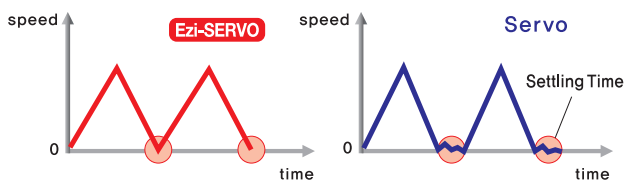
Ezi-SERVO is a high-precision servo drive, using a high-resolution encoder with 10,000 pulses/revolution.

Unlike a conventional microstep drive, the on-board high performance DSP (Digital Signal Processor) performs a vector control and filtering, producing a smooth rotational control with minimum ripples.



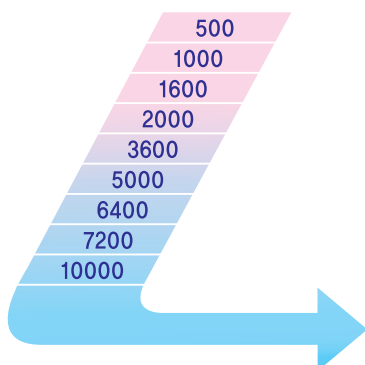
5 Fast Response

Similar to conventional stepping motors, Ezi-SERVO shows good synchronization with commanding pulses and realizes a short and fast response in a positioning action. Thus, it is a great feature of Ezi-SERVO when rapid motions with a short distance are required. For the case of traditional servo motor systems, there is a considerable delay between the commanding input signals and the resultant motion because of the constant monitor of the current position, necessitating a waiting time until it settles, called settling time.



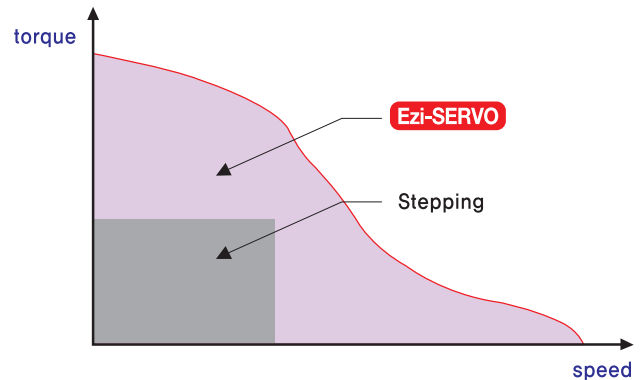
6 High Resolution

The unit of the position command can be divided precisely. (max. 10,000 pulses/revolution)



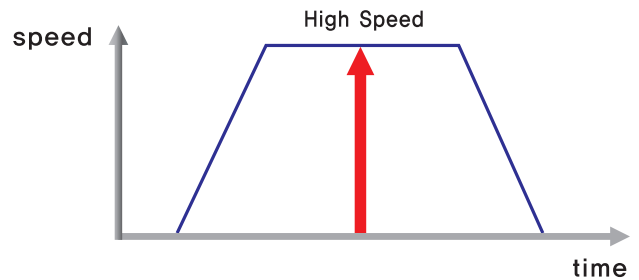
7 High Torque

Compared with common step motors, Ezi-SERVO can maintain a high torque state over relatively long period of time. It is possible for the driver to continuously operate without loss of synchronism under 100% of the load, there is no need to concern the load-tolerance, opposing to conventional microstep drives. Ezi-SERVO exploits high-torque in high-speed regime owing to the innovative optimum current phase control in accordance with rotational speeds.



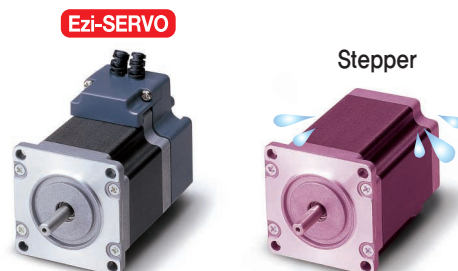
8 High Speed

The Ezi-SERVO functions well at high speed without the loss of synchronism. The ability of continuous monitoring of current positions enables a stepping motor to generate high-torque, even under a 100% load condition.



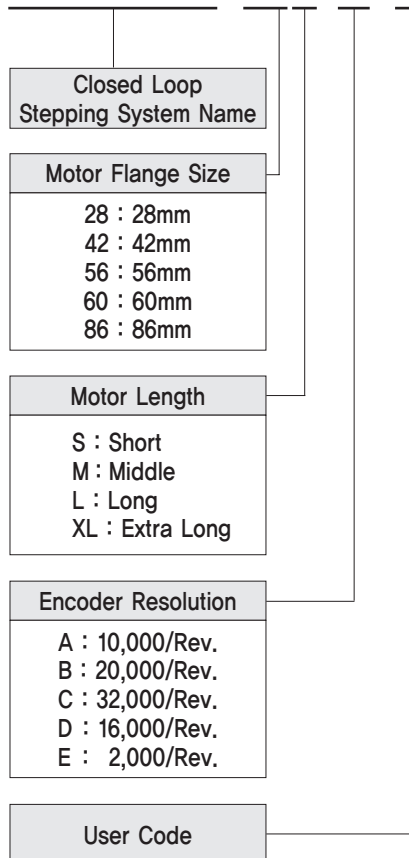
9 Load-dependant Current Control

Since the drive controls the operating current depending on the variation of a load condition, it is possible to reduce the heat generation, in turn improving the efficiency.



● Part Numbering

Ezi-SERVO-42S-A-□



*1 Jun. 09' will Release
*2 Jul. 09' will Release

● Combination list of Ezi-SERVO

Unit Part Number	Motor Model Number	Drive Model Number
Ezi-SERVO-28M-D *1	EzM-28M-D	EzS-PD-28M-D
Ezi-SERVO-28M-E	EzM-28M-E	EzS-PD-28M-E
Ezi-SERVO-28L-D *1	EzM-28L-D	EzS-PD-28L-D
Ezi-SERVO-28L-E	EzM-28L-E	EzS-PD-28L-E
Ezi-SERVO-42S-A	EzM-42S-A	EzS-PD-42S-A
Ezi-SERVO-42S-B	EzM-42S-B	EzS-PD-42S-B
Ezi-SERVO-42S-C	EzM-42S-C	EzS-PD-42S-C
Ezi-SERVO-42M-A	EzM-42M-A	EzS-PD-42M-A
Ezi-SERVO-42M-B	EzM-42M-B	EzS-PD-42M-B
Ezi-SERVO-42M-C	EzM-42M-C	EzS-PD-42M-C
Ezi-SERVO-42L-A	EzM-42L-A	EzS-PD-42L-A
Ezi-SERVO-42L-B	EzM-42L-B	EzS-PD-42L-B
Ezi-SERVO-42L-C	EzM-42L-C	EzS-PD-42L-C
Ezi-SERVO-42XL-A *2	EzM-42XL-A	EzS-PD-42XL-A
Ezi-SERVO-42XL-B *2	EzM-42XL-B	EzS-PD-42XL-B
Ezi-SERVO-42XL-C *2	EzM-42XL-C	EzS-PD-42XL-C
Ezi-SERVO-56S-A	EzM-56S-A	EzS-PD-56S-A
Ezi-SERVO-56S-B	EzM-56S-B	EzS-PD-56S-B
Ezi-SERVO-56S-C	EzM-56S-C	EzS-PD-56S-C
Ezi-SERVO-56M-A	EzM-56M-A	EzS-PD-56M-A
Ezi-SERVO-56M-B	EzM-56M-B	EzS-PD-56M-B
Ezi-SERVO-56M-C	EzM-56M-C	EzS-PD-56M-C
Ezi-SERVO-56L-A	EzM-56L-A	EzS-PD-56L-A
Ezi-SERVO-56L-B	EzM-56L-B	EzS-PD-56L-B
Ezi-SERVO-56L-C	EzM-56L-C	EzS-PD-56L-C
Ezi-SERVO-56XL-A	EzM-56XL-A	EzS-PD-56XL-A
Ezi-SERVO-56XL-B	EzM-56XL-B	EzS-PD-56XL-B
Ezi-SERVO-56XL-C	EzM-56XL-C	EzS-PD-56XL-C
Ezi-SERVO-60S-E	EzM-60S-E	EzS-PD-60S-E
Ezi-SERVO-60M-A *2	EzM-60M-A	EzS-PD-60M-A
Ezi-SERVO-60M-B *2	EzM-60M-B	EzS-PD-60M-B
Ezi-SERVO-60M-C *2	EzM-60M-C	EzS-PD-60M-C
Ezi-SERVO-60M-E	EzM-60M-E	EzS-PD-60M-E
Ezi-SERVO-60L-A *2	EzM-60L-A	EzS-PD-60L-A
Ezi-SERVO-60L-B *2	EzM-60L-B	EzS-PD-60L-B
Ezi-SERVO-60L-C *2	EzM-60L-C	EzS-PD-60L-C
Ezi-SERVO-60L-E	EzM-60L-E	EzS-PD-60L-E
Ezi-SERVO-60XL-A *2	EzM-60XL-A	EzS-PD-60XL-A
Ezi-SERVO-60XL-B *2	EzM-60XL-B	EzS-PD-60XL-B
Ezi-SERVO-60XL-C *2	EzM-60XL-C	EzS-PD-60XL-C
Ezi-SERVO-86M-A	EzM-86M-A	EzS-PD-86M-A
Ezi-SERVO-86L-A	EzM-86L-A	EzS-PD-86L-A
Ezi-SERVO-86XL-A	EzM-86XL-A	EzS-PD-86XL-A

● Advantages over Open-loop Control Stepping Drive

1. Reliable positioning without loss of synchronism.
2. Holding stable position and automatically recovering to the original position even after experiencing positioning error due to a external force, such as mechanical vibration.
3. Ezi-SERVO covers 100% full range of the rated torque, contrary to a conventional open-loop stepping driver that can use only up to 50% of the rated torque by considering loss of synchronism.
4. Capability to operate at high speed owing to a load-dependant current control, whereas open-loop drivers use a constant current control at all speed range without considering load variations.

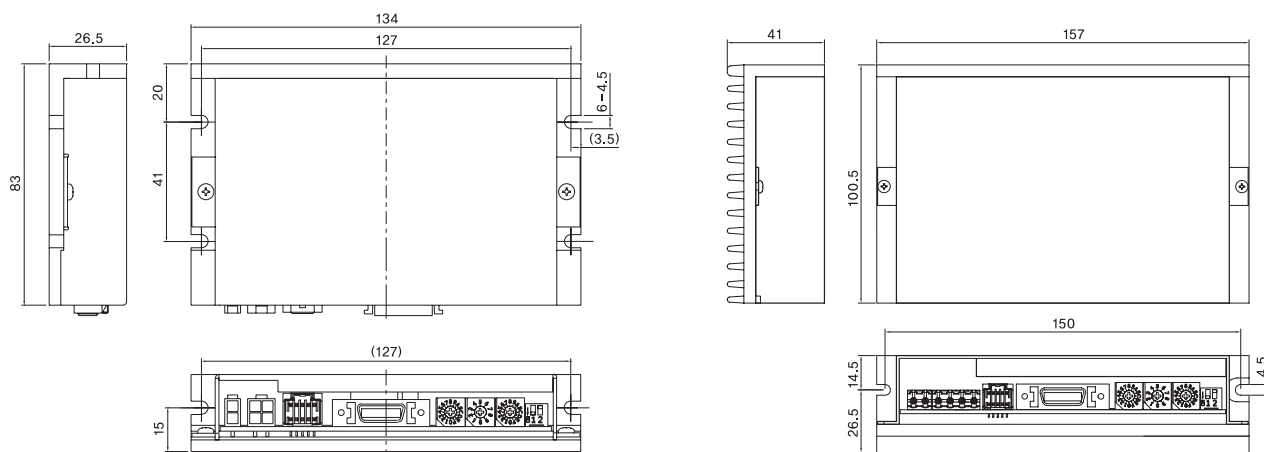
● Advantages over servo motor controller

1. No gain tuning(Automatic adjustment of gain in response to a load change.)
2. Maintain the stable holding position without fluctuation after completing positioning.
3. Possible to fast positioning owing to the independent control by on-board DSP.
4. Favorable continuous operation at short-stroke rapid movement process thanks to short positioning time.

● Specifications

Motor Model		EzM-28 series	EzM-42 series	EzM-56 series	EzM-60 series	EzM-86 series
Driver Model		EzS-PD-28series	EzS-PD-42series	EzS-PD-56series	EzS-PD-60series	EzS-PD-86series
Input Voltage		24VDC $\pm$ 10%	24VDC $\pm$ 10%	24VDC $\pm$ 10%	24VDC $\pm$ 10%	40~70VDC
Control Method		Closed loop control with 32bit DSP				
Current Consumption		Max 500mA (Except motor current)				
Operating Condition	Ambient Temperature	In Use : 0~55°C In Storage : -20~70°C				
	Humidity	In Use : 35~85% (Non-condensing) In Storage : 10~90% (Non-condensing)				
	Vib. Resist.	0.5G				
Function	Rotation Speed	0~3000rpm				
	Resolution(P/R)	2000/Rev. Encoder model : 500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000 10000/Rev. Encoder model : 500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000 16000/Rev. Encoder model : 500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 16000 20000/Rev. Encoder model : 500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 20000 32000/Rev. Encoder model : 500, 1000, 1600, 2000, 3600, 5000, 6400, 7200, 10000, 32000 (Selectable with Rotary switch)				
	Max. Input Pulse Frequency	500KHz (Duty 50%)				
	Protection Functions	Overcurrent, Overspeed, Step out, Overload, Overheat, Overvoltage, Inposition error Motor disconnect, Encoder disconnet, Input low voltage				
	LED Display	Power status, Alarm status, In-Position status, Servo On status				
	In-Position Selection	0~F(Selectable with Rotary switch)				
	Position Gain Selection	0~F(Selectable with Rotary switch)				
	Pulse Input Method	1-Pulse/2-Pulse(Selectable with DIP switch)				
	Rotational Direction	CW/CCW(Selectable with DIP switch)				
	Speed/Position Control Command	Pulse train input				
I/O Signal	Input Signals	Position command pulse, Servo On/Off, Alarm reset (Photocoupler input)				
	Output Signals	In-Position, Alarm (Photocoupler output) Encoder signal (A+,A-, B+, B-, Z+, Z-, 26C31 or Equivalent), (Line driver output)				

● Drive dimension [mm]

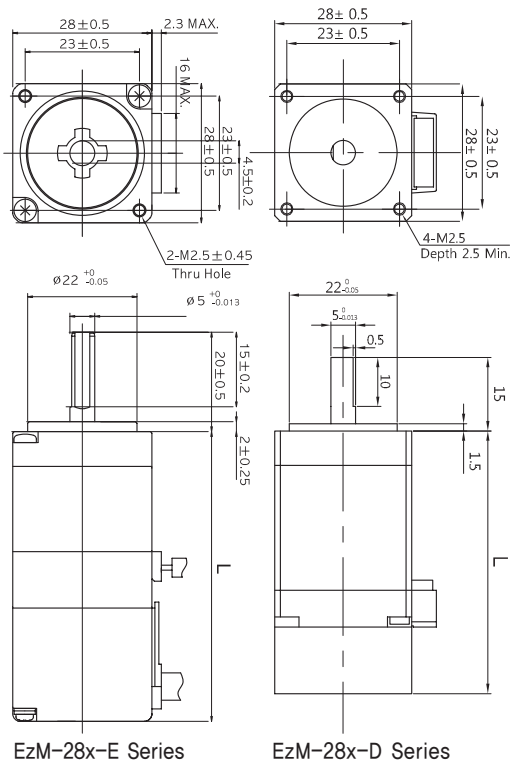


※Only for 86mm motor drive (EzS-PD-86 series)

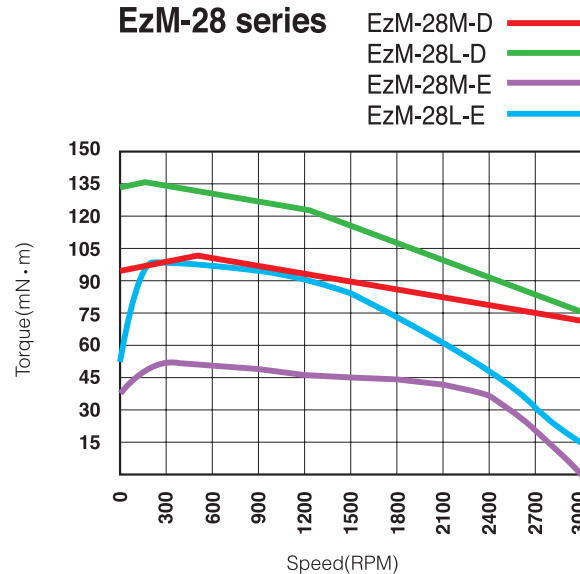
● Motor Specifications

M O D E L		UNIT	EzM-28M-D	EzM-28M-E	EzM-28L-D	EzM-28L-E
DRIVE METHOD		----	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR
NUMBER OF PHASES		----	2	2	2	2
VOLTAGE		VDC	3.0	2.5	3.0	3.5
CURRENT per PHASE		A	0.95	1.0	0.95	1.0
RESISTANCE per PHASE		Ohm	3.2	2.5	3.2	3.5
INDUCTANCE per PHASE		mH	2.5	1.6	2.8	2.3
HOLDING TORQUE		mN · m	120	51	140	100
ROTOR INERTIA		g · cm ²	13	9	18	16
WEIGHTS		g	155	145	215	235
LENGTH(L)		mm	59.0	58.5	66.0	77.8
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	30	30	30	30
	8mm		38	38	38	38
	13mm		53	53	53	53
	18mm		84	84	84	84
ALLOWABLE THRUST LOAD		N	Lower than MOTOR weight			
INSULATION RESISTANCE		Mohm	100min. (at 500VDC)			
DIELECTRIC STRENGTH		V/mm	500 (at 50Hz 1min.)			
TEMPERATURE CLASS		----	CLASS B (130℃)			
OPERATING TEMPERATURE		℃	0 to 55			
ALLOWABLE TEMPERATURE		℃	85Max			

● Motor Dimension [mm] and Torque Characteristics



EzM-28 series



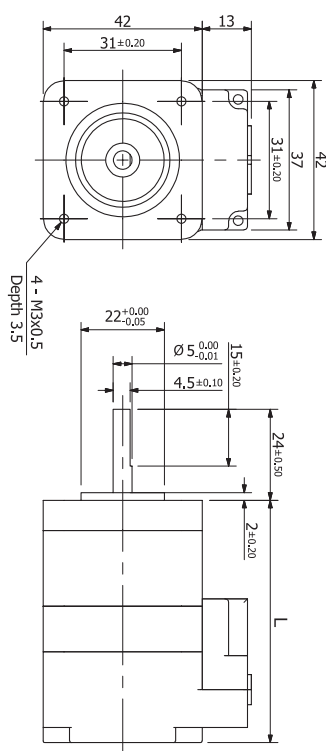
※Measured Condition

Input Voltage = 24VDC
 Motor Current = Rated Current
 (Refer to Motor Specification)
 Drive = Ezi-SERVO

● Motor Specifications

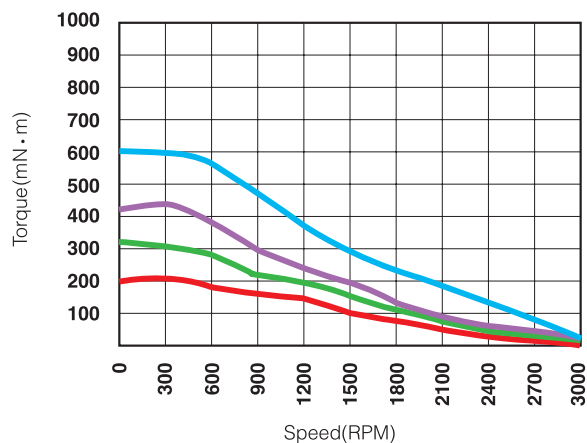
M O D E L	UNIT	EzM-42S-A EzM-42S-B EzM-42S-C	EzM-42M-A EzM-42M-B EzM-42M-C	EzM-42L-A EzM-42L-B EzM-42L-C	EzM-42XL-A EzM-42XL-B EzM-42XL-C
DRIVE METHOD	----	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR
NUMBER OF PHASES	----	2	2	2	2
VOLTAGE	VDC	2.2	2.7	3.0	7.2
CURRENT per PHASE	A	1.5	1.5	1.5	1.2
RESISTANCE per PHASE	Ohm	1.47	1.83	2.0	6.0
INDUCTANCE per PHASE	mH	1.81	2.77	3.67	6.3
HOLDING TORQUE	mN · m	270	400	490	750
ROTOR INERTIA	g · cm ²	36	54	76	114
WEIGHTS	g	250	305	390	555
LENGTH(L)	mm	59.0	65.0	73.0	83.0
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	22	22	22
	8mm		26	26	26
	13mm		33	33	33
	18mm		46	46	46
ALLOWABLE THRUST LOAD	N	Lower than MOTOR weight			
INSULATION RESISTANCE	Mohm	100min. (at 500VDC)			
DIELECTRIC STRENGTH	V/mm	500 (at 50Hz 1min.)			
TEMPERATURE CLASS	----	CLASS B (130℃)			
OPERATING TEMPERATURE	℃	0 to 55			
ALLOWABLE TEMPERATURE	℃	85Max			

● Motor Dimension [mm] and Torque Characteristics



EzM-42 series

EzM-42S ———
 EzM-42M ———
 EzM-42L ———
 EzM-42XL ———



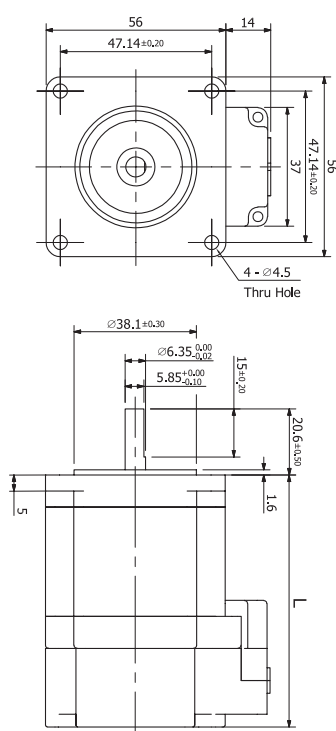
※Measured Condition

Input Voltage = 24VDC
 Motor Current = Rated Current
 (Refer to Motor Specification)
 Drive = Ezi-SERVO

● Motor Specifications

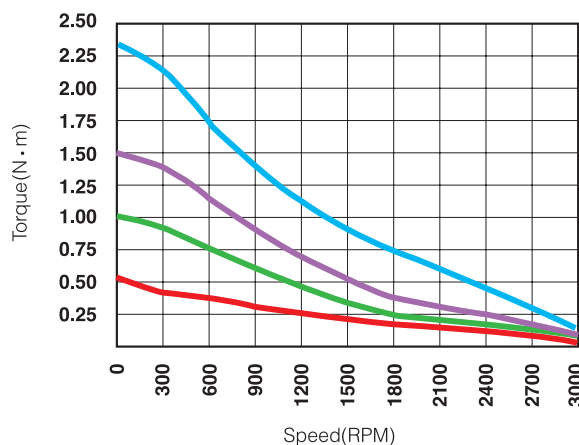
M O D E L	UNIT	EzM-56S-A EzM-56S-B EzM-56S-C	EzM-56M-A EzM-56M-B EzM-56M-C	EzM-56L-A EzM-56L-B EzM-56L-C	EzM-56XL-A EzM-56XL-B EzM-56XL-C
DRIVE METHOD	-----	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR
NUMBER OF PHASES	-----	2	2	2	2
VOLTAGE	VDC	1.89	2.28	2.82	3.57
CURRENT per PHASE	A	3.0	3.0	3.0	3.0
RESISTANCE per PHASE	Ohm	0.63	0.76	0.94	1.19
INDUCTANCE per PHASE	mH	2.64	3.80	6.30	7.97
HOLDING TORQUE	mN · m	810	1320	2490	3540
ROTOR INERTIA	g · cm ²	189	249	493	737
WEIGHTS	g	505	710	1185	1580
LENGTH(L)	mm	65.5	78.5	108.5	138.5
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	52	52	52
	8mm		65	65	65
	13mm		85	85	85
	18mm		123	123	123
ALLOWABLE THRUST LOAD	N	Lower than MOTOR weight			
INSULATION RESISTANCE	Mohm	100min. (at 500VDC)			
DIELECTRIC STRENGTH	V/mm	500 (at 50Hz 1min.)			
TEMPERATURE CLASS	-----	CLASS B (130℃)			
OPERATING TEMPERATURE	℃	0 to 55			
ALLOWABLE TEMPERATURE	℃	85Max			

● Motor Dimension [mm] and Torque Characteristics



EzM-56 series

EzM-56S —
 EzM-56M —
 EzM-56L —
 EzM-56XL —



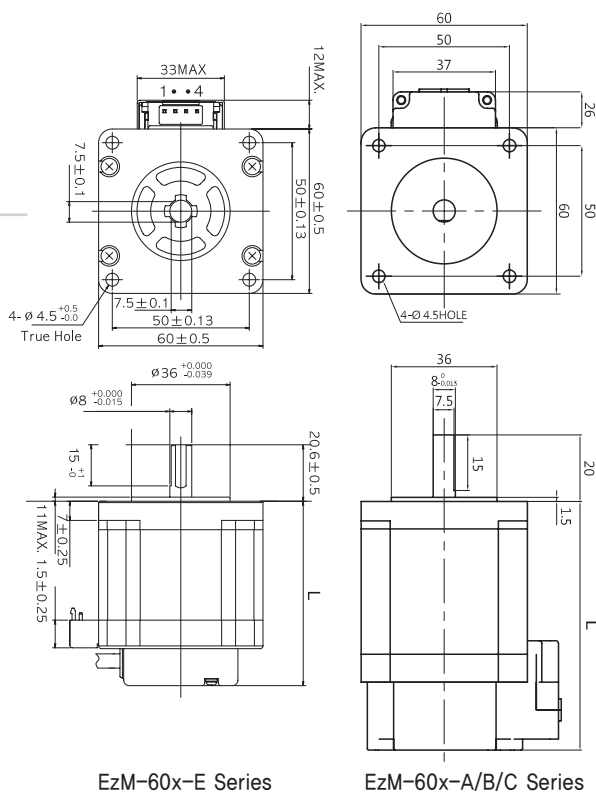
※Measured Condition

Input Voltage = 24VDC
 Motor Current = Rated Current
 (Refer to Motor Specification)
 Drive = Ezi-SERVO

● Motor Specifications

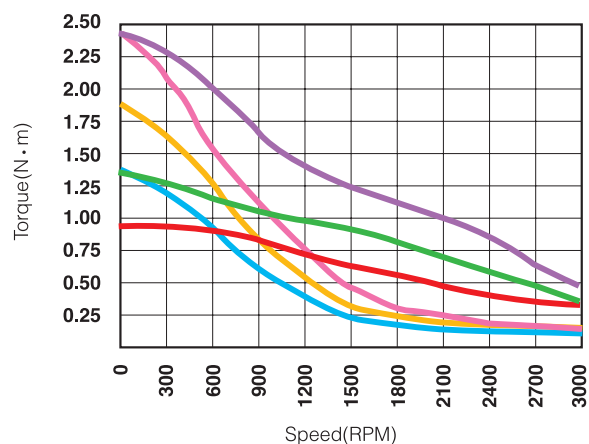
M O D E L	UNIT	EzM-60M-A EzM-60M-B EzM-60M-C	EzM-60L-A EzM-60L-B EzM-60L-C	EzM-60XL-A EzM-60XL-B EzM-60XL-C	EzM-60S-E	EzM-60M-E	EzM-60L-E
		BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR
DRIVE METHOD	----	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR	BI-POLAR
NUMBER OF PHASES	----	2	2	2	2	2	2
VOLTAGE	VDC	2.52	3.36	4.17	1.4	1.7	2.6
CURRENT per PHASE	A	2.8	2.8	2.8	4.0	4.0	4.0
RESISTANCE per PHASE	Ohm	0.9	1.2	1.5	0.35	0.43	0.65
INDUCTANCE per PHASE	mH	3.6	4.6	6.8	0.8	1.38	2.4
HOLDING TORQUE	mN · m	1650	2100	3100	880	1370	2700
ROTOR INERTIA	g · cm ²	400	570	840	275	400	840
WEIGHTS	kg	0.83	1.26	1.46	0.63	0.81	1.38
LENGTH(L)	mm	80.5	91.5	112.5	58.3	67.3	99.3
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	N	70	70	70	70	70
	8mm		87	87	87	87	87
	13mm		114	114	114	114	114
	18mm		165	165	165	165	165
ALLOWABLE THRUST LOAD	N	Lower than MOTOR weight					
INSULATION RESISTANCE	Mohm	100min. (at 500VDC)					
DIELECTRIC STRENGTH	V/mm	500 (at 50Hz 1min.)					
TEMPERATURE CLASS	----	CLASS B (130°C)					
OPERATING TEMPERATURE	°C	0 to 55					
ALLOWABLE TEMPERATURE	°C	85Max					

● Motor Dimension [mm] and Torque Characteristics



EzM-60 series

EzM-60S-E EzM-60M-A/B/C
 EzM-60M-E EzM-60L-A/B/C
 EzM-60L-E EzM-60XL-A/B/C



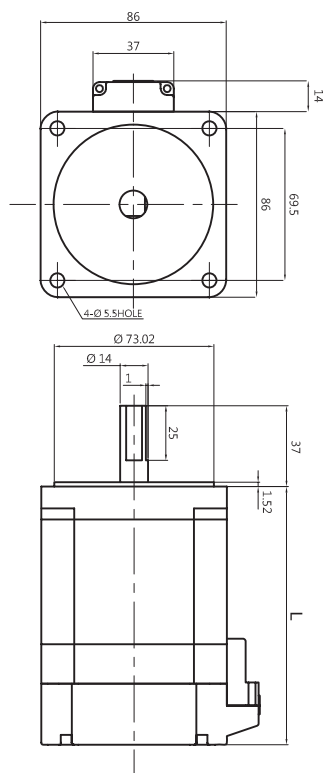
※Measured Condition

Input Voltage = 24VDC
 Motor Current = Rated Current
 (Refer to Motor Specification)
 Drive = Ezi-SERVO

● Motor Specifications

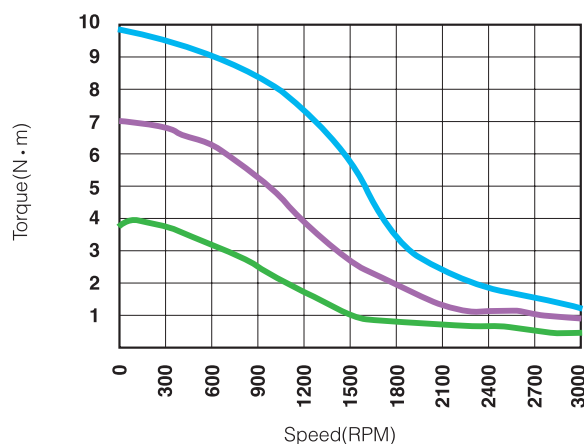
M O D E L	UNIT	EzM-86M-A	EzM-86L-A	EzM-86XL-A
DRIVE METHOD	----	BI-POLAR	BI-POLAR	BI-POLAR
NUMBER OF PHASES	----	2	2	2
VOLTAGE	VDC	2.4	3.6	4.38
CURRENT per PHASE	A	6.0	6.0	6.0
RESISTANCE per PHASE	Ohm	0.4	0.6	0.73
INDUCTANCE per PHASE	mH	3.5	6.5	8.68
HOLDING TORQUE	mN · m	4500	8500	12000
ROTOR INERTIA	g · cm ²	1400	2700	4000
WEIGHTS	kg	2.4	3.9	5.4
LENGTH(L)	mm	108	146	184
ALLOWABLE OVERHUNG LOAD (DISTANCE FROM END OF SHAFT)	3mm	270	270	270
	8mm	300	300	300
	13mm	350	350	350
	18mm	400	400	400
ALLOWABLE THRUST LOAD	N	Lower than MOTOR weight		
INSULATION RESISTANCE	Mohm	100min. (at 500VDC)		
DIELECTRIC STRENGTH	V/mm	500 (at 50Hz 1min.)		
TEMPERATURE CLASS	----	CLASS B (130℃)		
OPERATING TEMPERATURE	℃	0 to 55		
ALLOWABLE TEMPERATURE	℃	85Max		

● Motor Dimension [mm] and Torque Characteristics



EzM-86 series

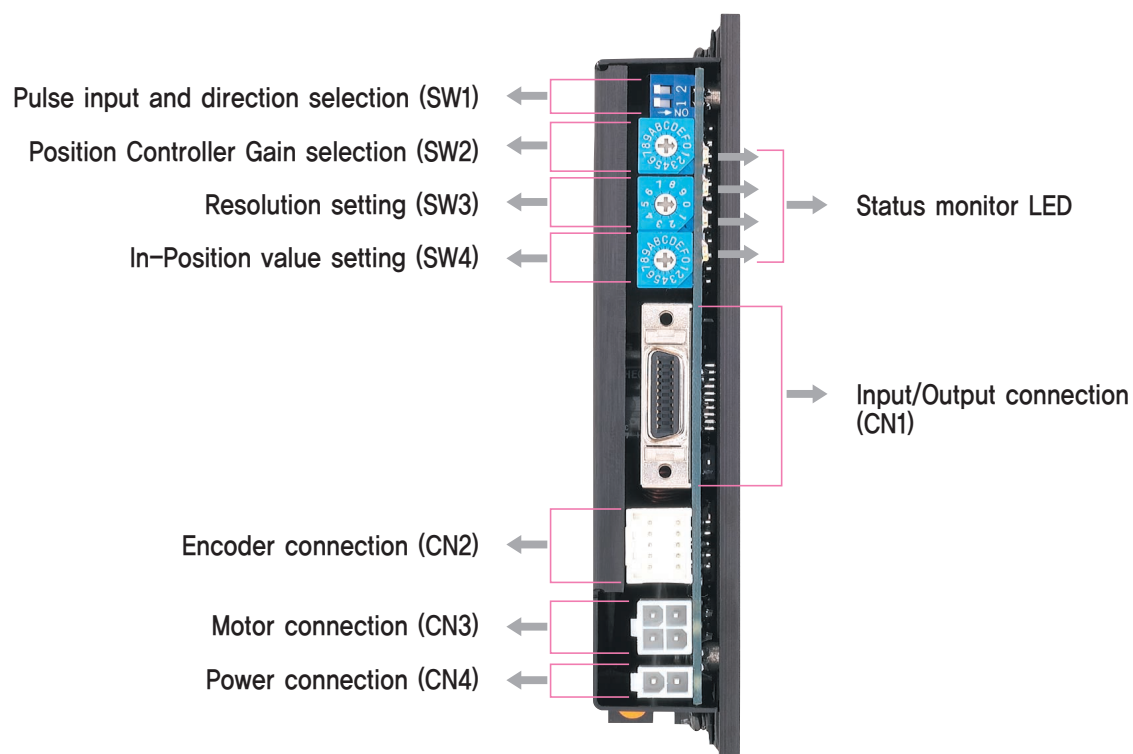
EzM-86M-A ———
 EzM-86L-A ———
 EzM-86XL-A ———



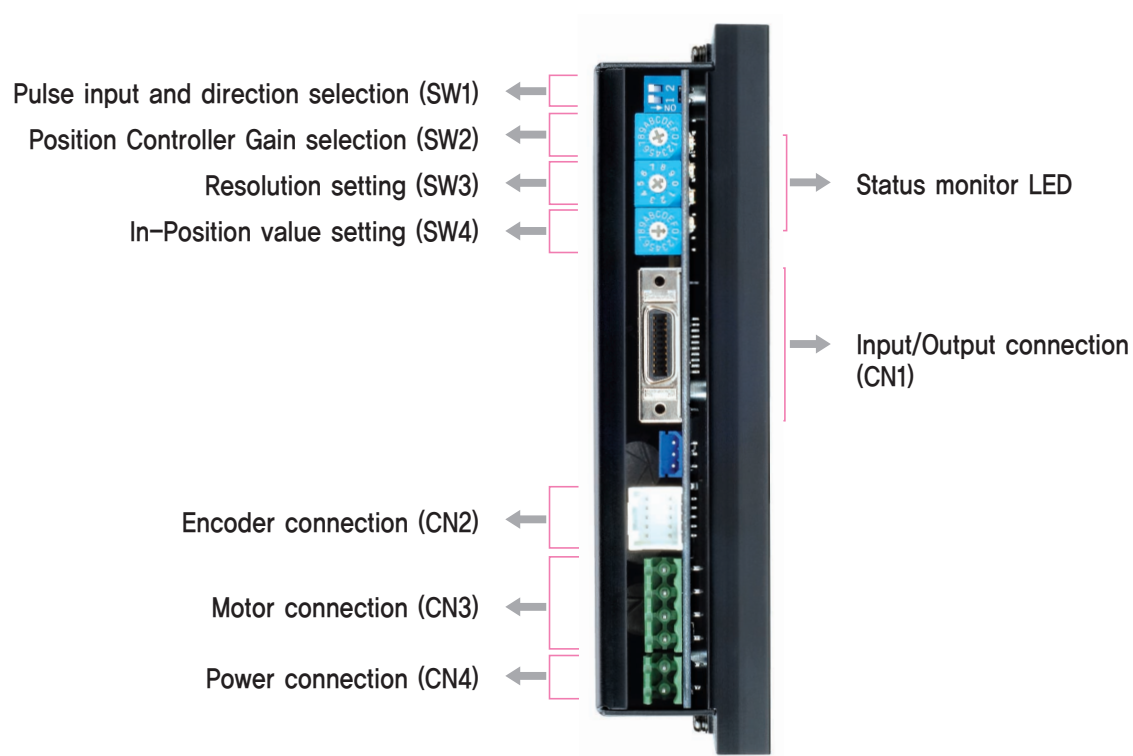
※Measured Condition

Input Voltage = 70VDC
 Motor Current = Rated Current
 (Refer to Motor Specification)
 Drive = Ezi-SERVO (EzS-PD-86 Series)

● Setting and Operating



◆ 86mm motor drive only(EzS-PD-86 Series)

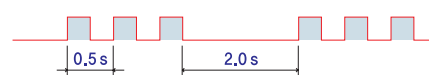


1. Status Monitor LED

Indication	Color	Function	ON/OFF Condition
POW	Green	Power input indication	LED is turned ON when power is applied
INP	Yellow	Complete positioning motion	Lights On when positioning error reaches within the preset pulse selected by rotary switch
SON	Orange	Servo On/Off indication	Servo On : Lights On Servo Off : Lights Off
ALM	Red	Alarm indication	Flash when protection function is activated (Identifiable which protection mode is activated by counting the blinking times)

◆ Protection functions and LED flash times

Times	Protection	Conditions
1	Overcurrent	The current through power devices in inverter exceeds the limit value
2	Overspeed	Motor speed exceed 3000rpm
3	Step-out	Position value is higher than specified value in motor stop status
4	Overload	The motor is continuously operated more than 5 second under a load exceeding the max. torque
5	Overheat	Inside temperature of drive exceeds 55°C
6	Over regenerated voltage	Back-EMF more than high limit value*1
7	Motor Connection	The power is ON without connection of the motor cable to drive
8	Encoder Connection	Cable connection error with Encoder connector in drive
9	Motor Voltage error	The power supplied to the motor is less than low limit value*2
10	Inposition error	After operation is finished, a position error occurs



Alarm LED flash(ex : Step out)

*1 : Voltage limit of Back-EMF depends on motor model

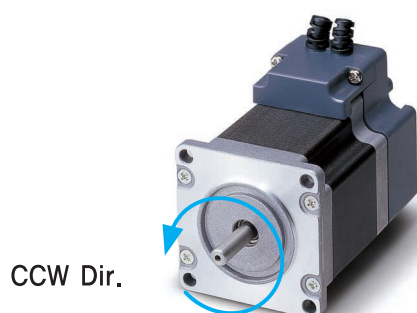
*2 : Low limit voltage value depends on motor model

2. Pulse input and motor direction selection switch(SW1)

Indication	Swich Name	Functions
2P/1P (pin #1)	Selecting pulse input mode	Selectable 1-Pulse input mode or 2-Pulse input mode as pulse input signal. ON : 1-Pulse mode OFF : 2-Pulse mode ※Default : 2-Pulse mode
DIR (pin #2)	Swiching Rotational Direction	Based on CW(+Dir signal) input to driver. ON : CCW(-Direction) OFF : CW(+Direction) ※Default : CW mode

Direction Selection : ON

Direction Selection : OFF



3. Position Controller Gain Selection switch(SW2)

The purpose of the Position Controller is to correct motor position deviation after stopping caused by load and friction. Depending on the motor load, the user have to select position of the switch because the system to be stable and to correct the error as fast as possible.

To tune the controller

1. Set the switch to "0" position.
2. Start to rotate the switch until system becomes stable.
3. Rotate the switch +/- 1~2 position to reach better performance.

Position	Time Constant of the Integral Part	Proportional Gain ^{*1}
0	1	1
1	1	2
2	1	3
3	1	4 ^{*2}
4	1	5
5	1	6
6	2	1
7	2	2
8	2	3
9	2	4
A	2	5
B	3	1
C	3	2
D	3	3
E	3	4
F	3	5

^{*1} Values in the columns are in relative units.They only show the parameter changes depending on the switch's position.

^{*2} Default : 3



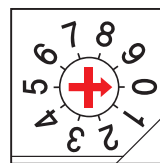
4. Resolution selection switch (SW3)

The number of pulse per revolution.

Position	Pulse/Rotation	Position	Pulse/Rotation
0	500 ^{*1}	5	3600
1	500	6	5000
2	1000	7	6400
3	1600	8	7200
4	2000	9	10000 ^{*2}

^{*1} Resolution value depend on encoder type.

^{*2} Default : 10,000



5. In position value setting switch(SW4)

To select the output condition of In-position signal. In-position output signal is generated when the pulse number of position error is lower than selected In-position value set by this switch after positioning command executed

Position	In-Position Value[Pulse] Fast Response	Position	In-Position Value[Pulse] Accurate Response
0	0 ^{*1}	8	0
1	1	9	1
2	2	A	2
3	3	B	3
4	4	C	4
5	5	D	5
6	6	E	6
7	7	F	7

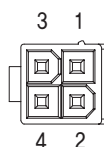
^{*1} Default : 0

※Please refer to User Manual for setup.

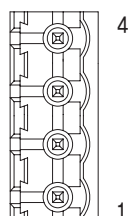


5. Motor Connector(CN3)

NO.	Function
1	A Phase
2	B Phase
3	/A Phase
4	/B Phase



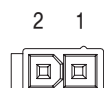
NO.	Function
1	/B Phase
2	B Phase
3	/A Phase
4	A Phase



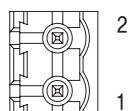
※Only for 86mm motor drive.

6. Power Connector(CN4)

NO.	Function
1	24VDC $\pm 10\%$
2	GND



NO.	Function
1	GND
2	40~70VDC



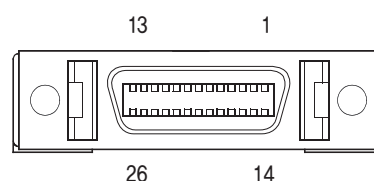
※Only for 86mm motor drive.

7. Input/Output signal(CN1)

NO.	Function	I/O
1	LIMIT+	Input
2	LIMIT-	Input
3	ORIGIN	Input
4	Digital In1	Input
5	Digital In2	Input
6	Digital In3	Input
7	Compare Out	Output
8	Digital Out1	Output
9	Digital Out2	Output
10	Digital Out3	Output
11	Digital Out4	Output
12	Digital Out5	Output
13	Digital Out6	Output
14	Digital In4	Input
15	Digital In5	Input
16	Digital In6	Input
17	Digital In7	Input
18	Digital In8	Input
19	Digital In9	Input
20	Digital Out7	Output
21	Digital Out8	Output
22	Digital Out9	Output
23	BRAKE+	Output
24	BRAKE-	Output
25	24VDC GND	Input
26	24VDC	Input

※BRAKE function is optional.

※There is no BRAKE function for 86mm motor drive.

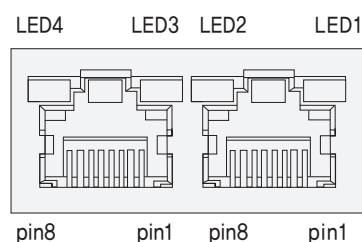


8. RS-485 Communication Connector(CN5)

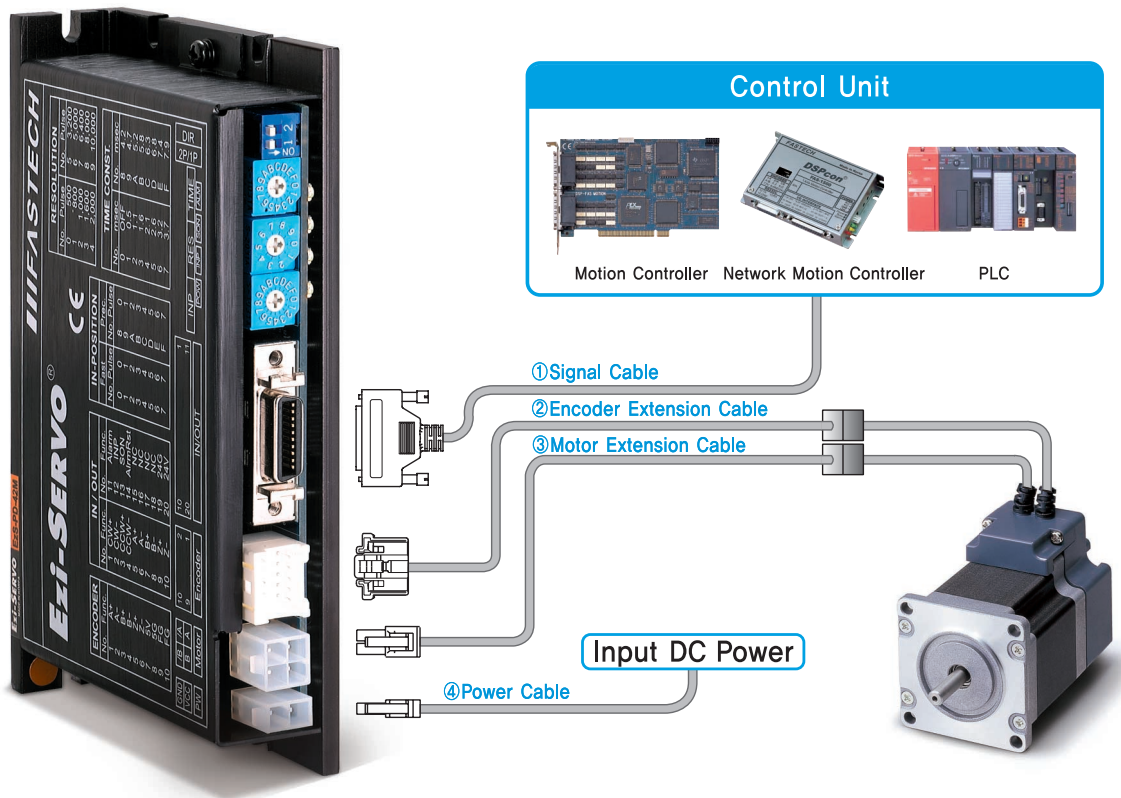
There are 2 kinds of converter for connecting PC.

- 1) RS-232 to RS-485
- 2) USB to RS-485

NO.	Function	NO.	Function
1	GND	6	Data-
2	GND	7	GND
3	Data+	8	GND
4	GND	LED 1, 3	Drive status
5	GND	LED 2, 4	Communication status



● System Configuration



Type	Power Cable	Motor Cable	Encoder Cable	Control Cable
Standard Length	—	30cm	30cm	—
Max. Length	2m	20m	20m	20m

1. Cable Option

① Signal Cable

Available to connect between Control System and Ezi-SERVO.

Item	Length[m]	Remark
CSVO-S-□□□F	□□□	Normal Cable
CSVO-S-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

② Encoder Extension Cable

Available to extended connection between Encoder and Ezi-SERVO.

Item	Length[m]	Remark
CSVO-E-□□□F	□□□	Normal Cable
CSVO-E-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

③ Motor Extension Cable

Available to extended connection between motor and Ezi-SERVO.

Item	Length[m]	Remark
CSVO-M-□□□F	□□□	Normal Cable
CSVO-M-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

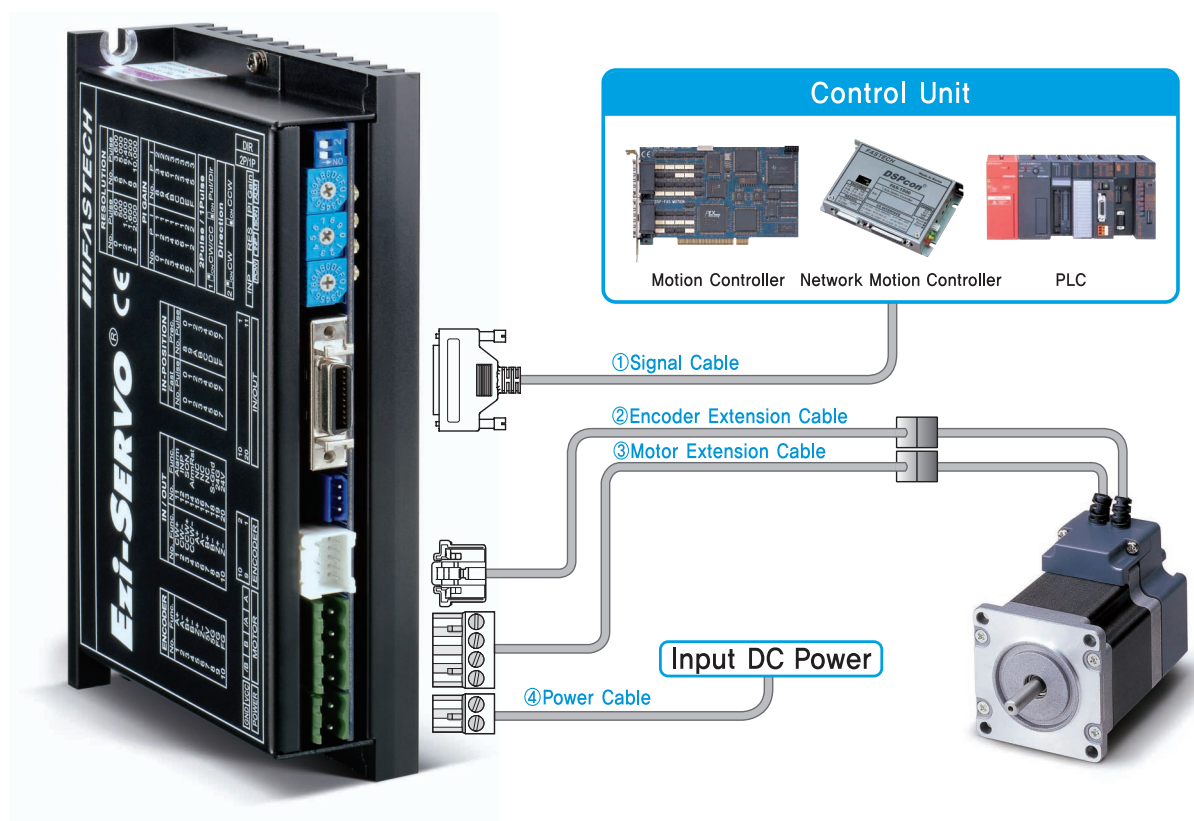
④ Power Cable

Available to connect between Power and Ezi-SERVO.

Item	Length[m]	Remark
CSVO-P-□□□F	□□□	Normal Cable
CSVO-P-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 2m length.

● System Configuration [Only for 86mm motor drive (EzS-PD-86 series)]



Type	Power Cable	Motor Cable	Encoder Cable	Control Cable
Standard Length	—	30cm	30cm	—
Max. Length	2m	20m	20m	20m

1. Cable Option

① Signal Cable

Available to connect between Control System and EzS-SERVO.

Item	Length[m]	Remark
CSVO-S-□□□F	□□□	Normal Cable
CSVO-S-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

② Encoder Extension Cable

Available to extended connection between Encoder and EzS-SERVO.

Item	Length[m]	Remark
CSVO-E-□□□F	□□□	Normal Cable
CSVO-E-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

③ Motor Extension Cable

Available to extended connection between motor and EzS-SERVO.

Item	Length[m]	Remark
CSVP-M-□□□F	□□□	Normal Cable
CSVP-M-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 20m length.

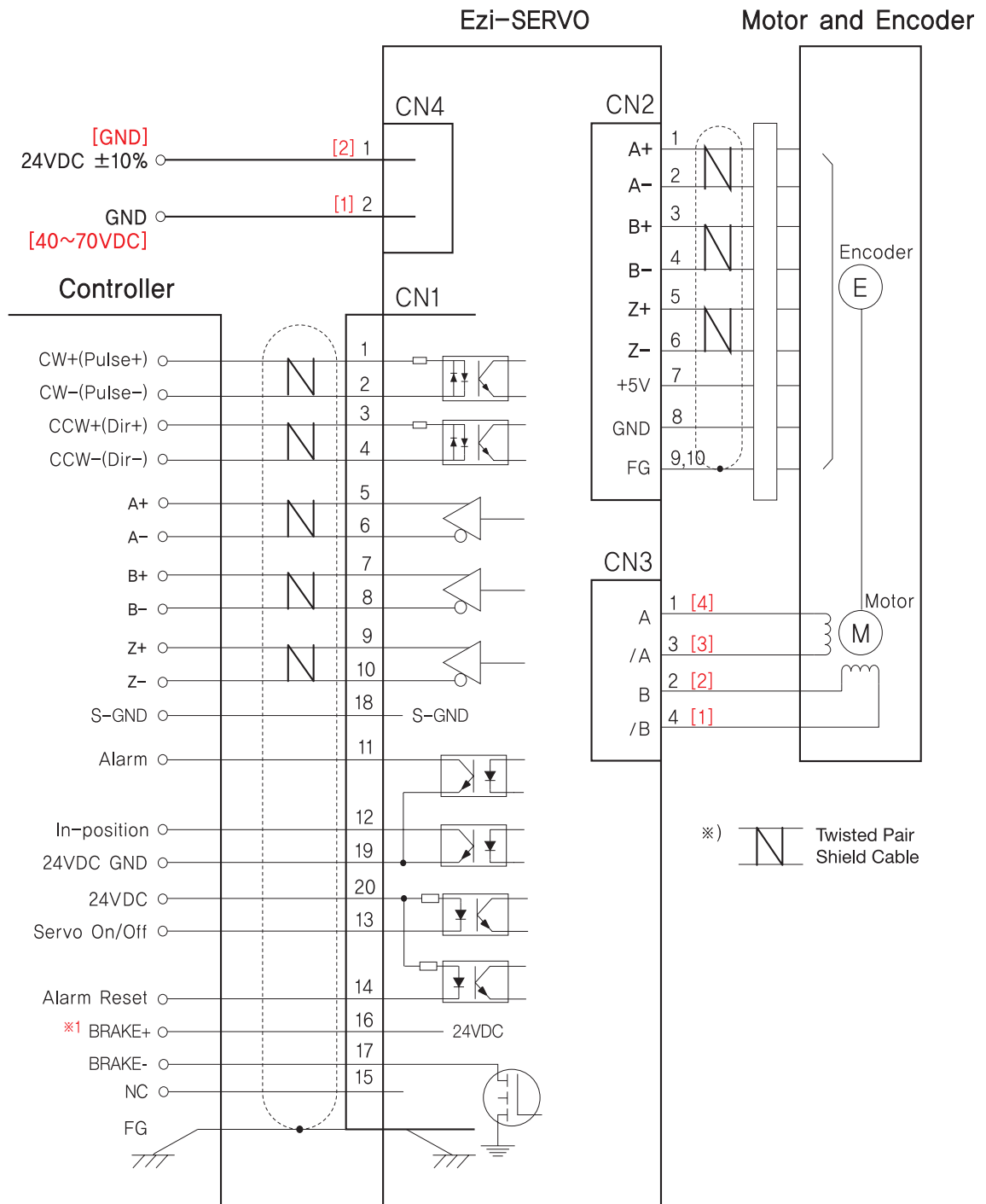
④ Power Cable

Available to connect between Power and EzS-SERVO.

Item	Length[m]	Remark
CSVP-P-□□□F	□□□	Normal Cable
CSVP-P-□□□M	□□□	Robot Cable

□ is for Cable Length. The unit is 1m and Max. 2m length.

● External Wiring Diagram

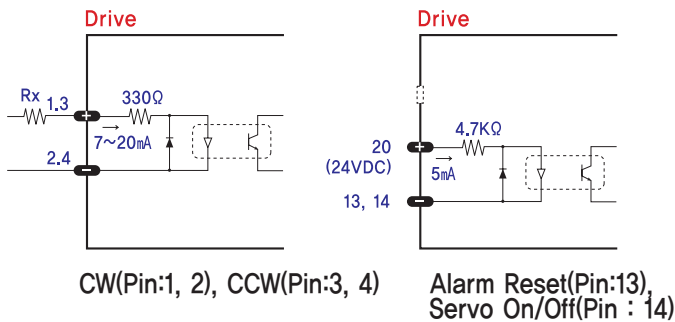


※Red color is only for 86mm motor drive. (EzS-PD-86 series) Pay attention to red color that describe the difference.
 ※There is no BRAKE function for 86mm motor drive.

Control Signal input/output Description

1 Input signals

Input signals of the drive are all photocoupler inputs. The signal shows the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



◆CW, CCW Input

This signal can be used to receive a positioning pulse command from a user-side host motion controller. A user can select 1-pulse input mode or 2-pulse input mode (refer to switch No.1, SW1). The input schematic of CW, CCW is designed for 5V TTL level. When using 5V level as an input signal, the resistor Rx is not used and connect to the driver directly.

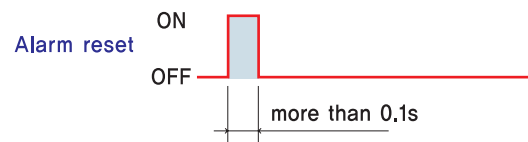
When the level of input signal is more than 5V, have to add Rx. If this resistor is absent, the inner schematic can be broken. In input signal level is 12V case, Rx value is 2.2kohm and in 24V case, 4.7kohm is suitable for Rx value.

◆Servo On/Off Input

This input can be used only to adjust the position by manually moving the motor shaft from the load-side. By setting the signal [ON], the driver cuts off the power supply to the motor. Then, one can manually adjust output position. When setting the signal back to [OFF], the driver resumes the power supply to the motor and recovers the holding torque. When driving a motor, one needs to set the signal [OFF].

◆Alarm Reset Input

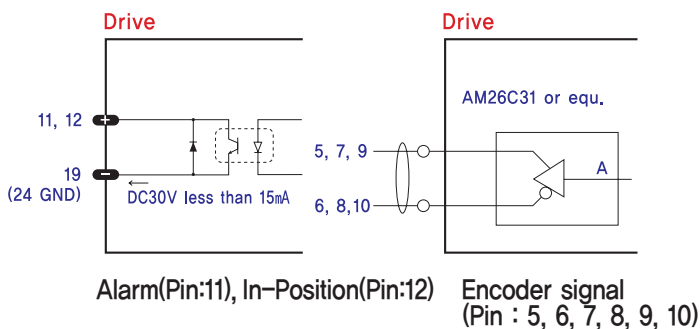
When a protection mode has been activated, a signal to this alarm reset input cancels the Alarm output.



※ By setting the alarm reset input signal [ON], cancel the Alarm output. Before cancel the Alarm output, have to remove the source of alarm.

2 Output signals

As the output signals from the driver, there are the photocoupler outputs (Alarm, In-Position) and the line driver outputs(encoder signal). In the case of photocoupler outputs, the signal indicates the status of internal photocouplers [ON: conduction], [OFF: Non-conduction], not displaying the voltage levels of the signal.



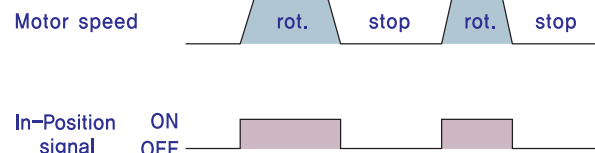
◆Alarm Output

The Alarm output indicates [ON] when the driver is in a normal operation. If a protection mode has been activated, it goes [OFF]. A host controller needs to detect this signal and stop sending a motor driving command. When the driver detects an abnormal operation such as overload or overcurrent of the motor, it sets the Alarm output to [OFF], flash the Alarm LED, disconnect the power to a motor and stop the motor simultaneously.

[Caution] Only at the Alarm output port, the photocoupler operation is in reverse. When the driver is in normal operation the Alarm output is [ON]. On the contrary when the driver is in abnormal operation that start protection mode, the Alarm output is [OFF].

◆In-Position Output

In-Position signal is [ON] when positioning is completed. This signal is [ON] when the motor position error is within the value set by the switch SW4.



◆Encoder signal Output

The encoder signal is a line drive output. This can be used to confirm the stop position.



FASTECH Co., Ltd.

Rm #1403, Bucheon Technopark 401 Dong, Yakdae-dong,
Wonmi-Gu, Bucheon-si, Gyeonggi-do, Rep. Of Korea (Zip:420-734)
TEL : 82-32-234-6300, 6301 FAX : 82-32-234-6302
Email : fastech@empal.com Homepage : www.fastech.co.kr